Hermann

Dear Joshua!

Let me be permitted to give you a short report about some main results from research in starforming bacteria:

1.) strain $B_6$, I did show you in Madison

| | mutants | | |
|---|---|---|---|
| red pigment formation ( carotenoid ) | r | poor pigment production leukos | l |
| rough colonie formation | R | smooth | S |
| Streptomycin resistance different degree resistance from 0,02 - 1,0% | $Sm^r$ | | $Sm^s$ |
| Aneurin auxotroph | $aneu^-$ | aneurin prototroph | $aneu^+$ |
| Adenin " | $ad^-$ | adenin " | $ad^+$ |
| needs casein hydrolysate polyauxotroph high back mutation rate $=10^{-3}$ | aux | | prot |

cross experiments

a.) l R $aneu^-$ $Sm^r$ X r R $ad^-$ $Sm^r$

selective medium : minimal medium DO

recombination type : l R $aneu^+$ $ad^+$ $Sm^r$

" rate : $5X\ 10^{-6}$

b.) l R $aneu^-$ $Sm^r$ X r R $Sm^s$

selective medium : DO + Sm

recombination type : r R $aneu^+$ $Sm^r$

" rate : ~~strain~~ $4 \times 10^{-6}$

c.) l R $aneu^-$ $Sm^r$ X r S $Sm^s$

selective medium : DO + Sm

recombination type : r S $aneu^+$ $Sm^r$

" rate : $3 \times 10^{-6}$

The recombination with a smooth strain is an exception by this high-starforming type. All other smooth strains are low star formers and do'nt show any recombination.

2.) strain Agrobacterium stellulatum

mutants

| | R | S |
|---|---|---|
| 0,02 - 1% | $Sm^r$ | $Sm^s$ |
| penicillium resistance by means of penicillinase-production, 300U/ccm, pen | $pen^r$ | $pen^s$ |
| isoleucin auxotroph | $ileu^-$ | $ileu^+$ |

cross - experiments

R $pen^r$ X R $Sm^r$

selective medium : nutrient agar + 0,5% Streptomycin + 300 U/ccm Penicillin

recombination type : R $pen^r$ $Sm^r$

" rate : $3 \times 10^{-5}$

With S strains no recombination is observed.

3. ) strain $B_{13}$ Spirillum spec.?

mutants

| | | | |
|---|---|---|---|
| yellow-grey pigment | gr. | yellow-red pigment | r |
| 0,04 - 1,0% | $Sm^r$ | | $Sm^s$ |
| Chloramphenicol 10 γ/ccm | $chlor^r$ | | $chlor^s$ |
| Valin auxotr. | $val^-$ | valin prototr. | $val^+$ |
| Cystin " | $cy^-$ | | $cy^+$ |
| Threonin " | $thr^-$ | | $thr^+$ |
| Valin, Leucin, Isoleucin auxotr. not clear cut | II$^-$ | | II$^+$ |

cross experiments

gr $cy^-$ $chlor^r$ X r $thr^-$

selective medium : DO + chloramphenicol$_r$

recombination types : gr $cy^+$ $thr^+$ $chlor^r$
r $cy^+$ $thr^+$ $chlor^r$

" rate $10^{-6}$
gr 1/3
r 2/3

In all cross experiments with the three strains samples of the parental strains has been plated in the same media as samples of the crosses to prevent any misinterpretation caused by spontan backmutations.

In $B_{13}$ cross the phänotypic expression of the recombinants needs 5 - 8 days. I can't explain this lag period.

$B_{13}$ seems to be more convenient for the genetical work as the other two strains, but more experience is necessary.

All crosses are performed in nutrient broth tubes puted in a tube-roller. After 3 - 5 days the suspensions are washed twice and than samples are plated in the selective media and distinct solutions in nutrient agar for cell count. If the cells are coherent in „ agglutinatione sessuale " ($B_6$ and A.stellulatum) the clusters becomes disrupted by a high speed mixer before washing.
I think these results are sufficient to give evidence for recombination in starforming bacteria but they give not information about the way of exchange.

Now I will prepare a publication of some of the results. I have learned in your lab to work genetically with bacteria- it was the happiest learning time I ever had.-I am thanksful every time to Esther and you and I should like to know if you want to participate in any way in the publication. Give me a short notice about your wishes please.

Many thanks for the seasons greetings from Esther and you.- We have a very early springtime this year, the first flowers come in blossom now, crocus and eranthis hiemalis.

Did you saw some of the olympic games in Squaw vallay?

All good wishes to Esther and you from Barbara

Sincerely yours

Wolfram